Student Satisfaction on Online Mathematics Learning: A Literature Review

Norazzila Shafie, Ahmad Fauzi Ayob, Fatimah Ramli, Tengku Noorainun Tengku Shahdan, Shahir Liew

INTRODUCTION

- Mathematics- important, nature of the course, unique challenges

- Student satisfaction - Students an asset to the institution (Parahoo et al., 2016), Potential contributor/donor as alumni (Parahoo et al., 2013), They can spread word-of-mouth positively (Alves & Raposo, 2009)

ONLINE LEARNING

- Allen and Seaman (2011)

Course Delivered Using Internet	Course Mode
1% -29%	Web-facilitated
30%-79%	Blended
More than 80%	Online

METHODOLOGY

- literature review combined snowball sampling and systematic database searches with reverse and hand searches
- peer-reviewed articles related to (1) Online learning mathematics , (2) , students' satisfaction (3) higher education
- Other terms: motivation, distance education, student satisfaction, online courses, feedback, perceptions, performance, student-student interaction, student instructor interaction, social presence and student engagement

Data sources:

- The databases : EBSCO, ProQuest, Elsevier, Science Direct,10 years : 2009 – 2018

SELF-REGULATED LEARNING (SRL)

- SRL refers to students' systematic effort to manage their learning process to achieve goals (Zimmerman & Schunk, 2011)
- Often, SRL is explained with motivation, emotion, and learning strategies (Abar & Loken, 2010).
- Research has shown that self-regulation is critical in determining students' successful learning experiences in an online learning environment (Cho & Kim, 2013).

SELF-REGULATED LEARNING (SRL)

- Cho and Kim (2013) - students' mastery-oriented goals are positively related to their self-regulation for interaction in online learning environments.
- Cho and Shen (2013) - students' intrinsic goal orientation is positively related to their self-efficacy for learning and performance as well as metacognitive self-regulation in an asynchronous online learning environment.
- Cho & Heron (2015) - only motivational and emotional variables significantly predicted 63.1% of the variance in satisfaction, however, learning strategies did not influence student satisfaction (online survey of 229 college students, remedial mathematics courses)

INTERACTION

- What constitutes meaningful mathematics engagement?
- The lack of interactions in both quantity and quality can impact students' motivation, emotions, and cognitive processes that typically involve social influence (Schunk, Pintrich & Meece, 2008 ; ChanMin, Seung Won & Cozart, 2014)
- Moore and Kearsley (1996) and Hillman (1994) model: Learner-Instructor, Learner-Learner, Learner-Content, and Learner-Technology interactions

INTERACTION

Online mathematics students are diverse in terms of interactional preferences (Warren, 2018):

- Learner-Instructor – value of going directly to Instructor
- Learner-Learner – teaching others as a way to help oneself learning
- Learner-Content – lack of confidence & high confidence in their own maths ability
- Learner-Technology interactions – outset of class, only interact with technology followed by content

ADDITIONAL SUPPORT

- Many studies report that the students at tertiary level - lacking/losing of mathematics skills (Galligan et al., 2010, Matzakos & Kalogiannakis, 2018)
- Mestel et al., 2011: Longitudinal experimental support program in Mathematics that uses synchronus communication through the Elluminate Live software - received positive feedback both from the instructors and the students
- Zimmermann et al., 2013: Video-recorded mathematics lessons – positive effect on the final exams of first-year students in the University of Ludwigsburg

ADDITIONAL SUPPORT

- Johnston, et al., 2016: A support program in mathematical skills developed for the first-year Chemistry students, Queensland University- this program has a positive impact on the mathematical skills that the students needed in the chemistry courses

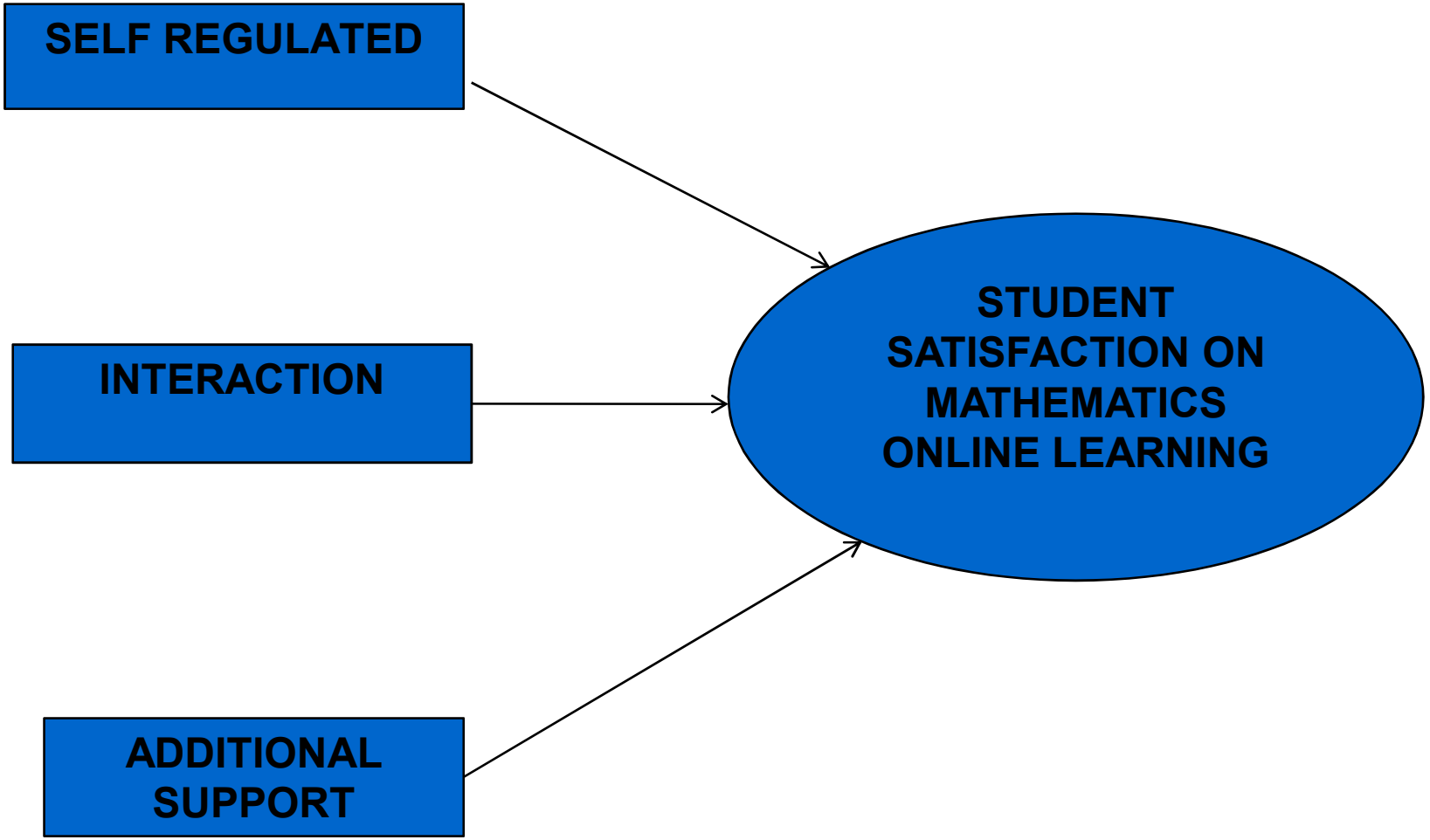
- Matzakos & Kalogiannakis, 2018 : An online support distance-learning program in Mathematics (SDLPM) was developed to aid first year engineering students - the students liked the program, they felt comfortable with the environment, the tools and the material used

ADDITIONAL SUPPORT

SDLPM tools (Matzakos & Kalogiannakis, 2018):

- Reading activities
- Samples with solutions
- Self-assessment exercises (True/False and multiple choice questions)
- Dynamic presentation material, GeoGebra files
- Sources of audiovisual material and carefully chosen videos

FRAMEWORK


SELF REGULATED
INTERACTION
ADDITIONAL SUPPORT
STUDENT SATISFACTION ON MATHEMATICS ONLINE LEARNING

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Thank
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